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EXAMINER	
JANKUS, ALMIS R	
ART UNIT	**PAPER NUMBER**
2671	5

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/929,146	Applicant(s) OKA, MASAAKI	
	Examiner Almis R Jankus	Art Unit 2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 August 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5,7-10 and 12-20* is/are rejected.

7)☒ Claim(s) *2,6 and 11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-20 are presented for examination.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3-5, 7-10, and 12-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Economy et al. in view of Fournier et al.

With respect to claim 1, Economy et al. teaches the claim determining the x and y coordinate values of a shape specific point for specifying a shape of a three dimensional graphic. They teaches this at figure one and at figure two, but figure two shows a single side of the triangle shown in figure one for simplification where the point 14-1 corresponds to the shape specific point. Determining the x and y coordinates can be found at column five teaching that when the breakpoint of 14-1 constitutes the midpoint of side 12-1 then the x, y, and z coordinates of breakpoint 14-1 are the average of the sum of the respective x, y, and z coordinates of the vertices of v1 and v2 which are also the endpoints of side 12-1, polygon 10, at which the breakpoint of 14-1 lies. Economy further teaches calculating a z coordinate value of the shape specific

point based on a generated random number. Economy teaches this at column six with a teaching that the vertices 18-1 and 18-2 which have the same x and y components as does the breakpoint 14-1 with the z component modified by the value of dzact; and the value of dzact may be determined with the equation shown in column six. Part of that equation includes the term dztlu which is a based deviation value for the z coordinate; and further down in column six Economy teaches that the scaling factor ksz is only required when dztlu is a random deviation. Also, at column seven Economy teaches that the invention may be used to generate non specific fine detail wherever such fine detail may be required or desired without having previously determined or stored fine detail, when the statistical data such as random or pseudo-random deviations are used. Also, at column seven they teach that according to the type of terrain or feature being simulated the value of each dztlu may be a random or pseudo random value. Economy also teaches generating the graphic data based on the z coordinate value and the x and y coordinate values of the shape specific points, at figure six with the teaching of processing the polygons of display. While Economy teaches most featured claims it is noted that generating a random number using the x and y coordinate values as seeds is not explicitly taught. However, Fournier likewise teaches computer rendering of stochastic models and teaches explicitly using the seed for the random number generation as having explicit control over the seed and in order to allow external consistency. At page 377 Fournier teaches that internal consistency with respect to scale is assured by tying the seeds of the random number generator to the positions of the points calculated. Of course the positions of the points calculated are, for example

on page 376 and at figure 4, the point fmid is the point calculated between f1 and f2. Also, at page 379 Fournier teaches that internal consistency with respect to position requires that the seeds of the random number generator be indexed by some sort of invariant point identifiers rather than by functions dependant on the positions of the points. An obvious requirement is that the same random displacements must be generated on each boundary by which can be accomplished again by tying the seeds of the random number generator to identifiers of points on the boundary making certain that the same identifiers are assigned to corresponding points in the representation of each of the polygon's boundary; and this, of course, is because an adjacent polygon would need to have the same z value with the same amount of the displacement as the initial polygon or else there would be a discontinuity. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the instant invention to use the teachings of Fournier and apply them to the spatial augmentation of vertices of Economy because this way the external and internal consistency can be maintained, as taught by Fournier.

Claim 3 is similar to claim 1 but further requires setting a shape specific point provisionally among a plurality of shape specific points for specifying the shape of said three dimensional graphics which Economy teaches at figure one where the shape specific points are v1, v2, v3 and the calculated midpoints are 14-1, 14-2, and 14-3 and also along with the displacements of the calculated points in the z direction; calculating the x and y coordinate values of said provisional shape specific points and generating a

random number using and x and y coordinate values as seeds again the calculating the x and y coordinates are the same as was discussed in claim one with respect to generating a midpoint and calculating a z coordinate value based on the generated random number also as discussed in claim one and using the point including the calculated x , y and z coordinating values as a new shape specific point. And generating a new graphic based on the shape specific point corresponds to the, for example, figure two point 18-1 which is the point which has the same x and y coordinates as the midpoints as 14.1 but is displaced in the z direction thereby generating a new shape specific point. Similar to claim one the generating a random number using the x and y coordinate values as seeds is not explicitly taught by Economy, however, as described in the rejection of claim one Fournier teaches this. The rationale applied to claim one is likewise implied here to claim three with the obviousness of using Fournier along with Economy.

Claim 4 further requires the x and y coordinate values of the new shape specific point to be the x and y coordinate values of the midpoint between a pair of shape specific points which is the basis thereof. Economy again teaches this in figure one and two and at column five line twenty to line sixty.

Claim 5 requires the x and y coordinate values of the new shape specific point to be the x and y coordinate values of the midpoint of a virtual line connecting a midpoint of the first side of the quadrangle formed on a projecting plane when each of two pairs

of shape specific points which are the basis thereof is projected on the x y plane and a midpoint of the second side facing said first side. Fournier teaches this on page 379 in the second column with the teaching that a quadrilateral can be subdivided in a slightly more complex way. Generate the midpoint of each of the four sides using fractal polyline subdivision. For each of the two pairs of opposed midpoints displaced the midpoint of the line connecting them using the same procedure. The midpoint of the line connecting these two midpoints becomes the center point of the quadrilateral subdivision and four smaller quadrilaterals are generated. This process is continued as with triangles until the desired resolution is obtained resulting in a fractal quadrilateral whose surface is composed of many quadrilateral facets.

Claim 7 is similar to claim 1, however it requires only a one dimensional primitive as described by Fournier that is that the requirement of provisionally setting a shape specific point between a neighboring shape specific points when a plurality of shape specific points for specifying the shape of said two dimensional graphic is projected on the x axis which corresponds essentially to figure four on page 376 of Fournier generating a random number using the x coordinate value of the provisional shape specific point as a seed of random numbers which is taught at Fournier under the explicit seed control where the internal consistency with respect to scale is assured by tying the seeds of the random number generator to the positions of the points calculated calculating the y coordinate value based on the generated random number again as shown in figure six page 377 or at figure four on page 376 and using the point including

the calculated x and y coordinate values as a new shape specific point and generating such graphic data based on the new shape specific point again shown at figures four and six.

Claim 8 requires a graphics generating apparatus for generating two dimensional or three dimensional graphics whose shape features are specified by positions of a plurality of shape specific points comprising a random number generator for generating a random number whose value is determined according to a seed entered, which is taught at Fournier with the teachings of the explicit control over the seed; and the determinator for determining positions of said plurality of shape specific points wherein the positions of at least one of said plurality of shape specific points is expressed by default coordinate values and variable coordinate values said determinator instructing the random number generator to generate a random number using the default coordinate values at one of such shape specific points as said seed and determines the position of said at least one shape specific point by calculating some variable coordinate values based on the random number. Essentially this is another way of saying that the default coordinate values correspond to the x and y values of the midpoint as taught in Economy et al the new shape specific point maintain the same x and y coordinate values as the calculated shape specific point which is the midpoint and variable coordinate value corresponds to the z coordinate value which has a random deviation as taught by both Economy and Fournier.

Claim 9 requires that when there is a plurality of default coordinate values the determinator generates the random number using random number generating functions differing from one coordinate value to another. This is taught by Fournier with the teaching that tying the seeds of the random number generator to identifiers of points on the boundary making certain that the same identifiers are assigned to the corresponding points in the representation of the polygons boundary is an obvious requirement thus in a triangle as shown at figures one and two of Economy for example, the different midpoints calculated, 14-1, 14-2, and 14-3, each have separate x y coordinates being a separate default value thereby satisfying the requirement of a plurality of default coordinate values and the random numbers generated using the different coordinate values then generates the corresponding z deviation.

Claim 10 requires the graphics to be a three dimensional graphics based on the x y and z coordinate values and that the default coordinate values are the x and y coordinate values of any one of the plurality of shape specific points and said variable coordinate values the z coordinate value of any one of said shape specific points. Again this was previously addressed with the rejections of claim ten.

Claim 12 requires a graphic to be a three dimensional fractal graphic which will probably reach the same point through a plurality of paths. This is essentially a definition of the fractal graphics which are taught by Economy and Fournier and that the endpoints remain the same but the displacements vary in between thereby generating a

plurality of paths and the F 1 followed the path and you would reach the same point because that point never changed.

Claim 13 requires a storage unit for storing x y and z coordinate values of at least two of the plurality of shape specific points. Economy teaches this at figure five item 60. Shape specific point generator for specifying the positions of shape specific points based on the x y and z coordinate values of a pair of shape specific points read from the storage unit and generating a midpoint of a virtual line connecting between the specified shape specific points as a new shape specific point, at figure five item 90; wherein the determinator instructs the random number generator to generate a random number using x and y coordinate values of the new shape specific point as said seed and determines the position of said new shape specific point by calculating the z coordinate value of said new shape specific point based on the random number. Again as discussed in the rejection of claim one, Economy teaches using a random displacement of the z coordinate values and Fournier teaches using the x and y coordinate values as seed values for calculating the z coordinate value. The rationale for the obviousness of combining these two references is the same as presented for the rejection of claim one.

Claim 14 is similar to claim 13, but further requires the virtual line connecting between a midpoint of a first side of a quadrangle formed on a projecting plane. Economy teaches the spatial augmentation using triangles; however, Fournier teaches using a similar technique for quadrangles at page 379 second column.

Claim 15 requires the shape specific point generator to generate repeatedly new shape specific points according to external instructions and a determinator to change the range of generating the random numbers every time a new shape specific point is generated. This corresponds to the teaching of Fournier at page 376 second column of the algorithm recursedly subdividing the interval and generating a scaler value at the midpoint which is proportional to the current standard deviation times the scale of roughness factor and what claim fifteen requires that changing the range of generating the random numbers every time a new shape specific point is generated corresponds to the value of the midpoint being proportional to the current standard deviation.

Claim 16 further requires the storage unit to additionally store the x y and z coordinate values of the new shape specific points generated as the shape specific points to be read. Economy teaches this at column twelve line forty eight to column thirteen line 44.

Claim 17 recites features which were previously addressed in above rejections however it requires a semi conductor device and an apparatus to perform the above functions. Economy teaches this at figure five.

Claim 18 requires a plurality of existing coordinate values and random number generator to generate random numbers using a plurality of random number generating

functions differing from one coordinate value to another. Again this corresponds to features discussed above wherein the new x y values supply new seeds to the random number generator thereby generating new values.

Claim 19 is similar to the claims discussed above with respect to the corresponding features, however it is drafted in a computer program form for rendering a computer to serve as a graphics generating apparatus. Economy teaches this at figure five.

Claim 20 requires the computer program of claim nineteen to be stored on the computer readable storage medium. Economy teaches this at figure five.

4. Claims 2, 6, and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter: With respect to claims 2 and 6, the prior art of record does not fairly teach the claimed "using two types of mutually different random number generating functions using the x and y coordinate values as seeds"; with respect to claim 11, the

prior art of record does not fairly teach the claimed "said default coordinate value is the x coordinate value of any one of said plurality of shape specific points, and said variable coordinate value is the y coordinate value of any one of said shape specific points."

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Almis R Jankus whose telephone number is 703-305-9795. The examiner can normally be reached on M-F, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman can be reached on 703-305-9798. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AJ

ALMIS R. JANKUS
PRIMARY EXAMINER